

DOCKET NO.: HENK-0184/H50058
Application No.: 10/808,992
Office Action Dated: May 21, 2007

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:
Schoenfeld

Confirmation No.: 7745

Application No.: 10/808,992

Group Art Unit: 1712

Filing Date: March 24, 2004

Examiner: Robert E. Sellers

For: Polycarboxy-Functionalized Prepolymers

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

**SUPPLEMENTAL DECLARATION OF
RAINER SCHOENFELD UNDER 37 C.F.R. § 1.132**

I, Rainer Schoenfeld, hereby declare the following:

1. I am the inventor of the above-captioned patent application ("the present application"). I received my diploma thesis in Chemistry from the University of Duesseldorf and did postgraduate work on Molecularly Imprinted Polymers (MIPs) at the Polymer Institute of the University of Duesseldorf. I am presently the head of the polymer research department at Henkel KGaA, assignee of the subject matter of the present application, in Duesseldorf, Germany.

2. I am skilled in the art of organic synthesis. I am also skilled in the art of structural analysis, including the interpretation of ^1H and ^{13}C Nuclear Magnetic Resonance ("NMR") spectra, as they pertain to organic molecules.

3. It is my understanding that the claims of the present application are directed to curable compositions containing certain polycarboxy-functionalized prepolymers, in particular, a curable composition comprising at least one polycarboxy-functionalized prepolymer having the structure $\text{R}^1[-\text{X}-\text{C}(=\text{O})-\text{CyCO}_2\text{H}]_q[-\text{X}-\text{C}(=\text{O})-\text{R}^3-\text{CO}_2\text{H}]_p[\text{X}-\text{H}]_{m-(n+p)}$, or at least one reaction product of said polycarboxy-functionalized prepolymer with at least one epoxy resin, or a mixture thereof, wherein R^1 is the m-valent radical of an elastomeric polymer, X is -S-

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or NR_2 -, Cy is an aromatic or aliphatic ring, R^2 is H or a C_1 - C_6 alkyl group R^3 is a radical containing at least one carbon-carbon double bond, m is an integer from 2 to 6, n is an integer from 1 to 6, p is 0 or an integer from 1 to 5, m is greater than or equal to $n+p$, and q is an integer of at least 2 and wherein said polycarboxy-functionalized prepolymer does not contain imide groups.

4. I have reviewed the Office Action dated May 21, 2007. I understand that the Examiner has maintained that there is no indication in U.S. Patent No. 5,093,382 that the reaction of a polyoxyalkylene polyamine and a polycarboxylic acid anhydride, such as trimellitic anhydride, forms imide groups.

5. I have reviewed the 382 patent. The only example of a reaction of a polyoxyalkylene polyamine and a polycarboxylic acid anhydride is Product F in the 382 patent. Product F is produced by the reaction of JEFFAMINE® D-2000 diamine and trimellitic anhydride (1/2 mole ratio). 382 patent at 15:43-33. The 382 patent states that Product F can be prepared "by the procedure put forth in U.S. Pat. No. 4,239,635 or alternatively, without the use of solvent at temperatures of about 210-235 °C." 382 patent at 15:25-29.

6. I reviewed the procedure set forth in U.S. Pat. No. 4,239,635, Example 1, and synthesized Product F according to that procedure as follows: Trimellitic anhydride (38.4 g, MW=192 g/mol, 0.2 moles) and Jeffamine D-2000 (206.2 g, MW=2062 g/mol, 0.1 moles) were reacted together in 70 mL of toluene, under a nitrogen atmosphere, at 140 °C for 3 hours. The water generated during the reaction was continuously removed. After the 3 hours, the toluene was removed at 80 °C under reduced pressure (0.1 mbar). I will refer to the product of this procedure as Product F-1.

7. I also prepared Product F according to the alternative procedure set forth in the 382 patent, i.e., "without the use of solvent at temperatures of about 210-235 °C," as follows: Trimellitic anhydride (38.4 g, MW=192 g/mol, 0.2 moles) and Jeffamine D-2000 (206.2 g, MW=2062 g/mol, 0.1 moles) were reacted together in the absence of solvent, at 210 °C, with stirring, for 3 hours. I will refer to the product of this procedure as Product F-2.

8. ^1H and ^{13}C NMR analyses were performed on both Product F-1 and Product F-2. These analyses were performed by Dr. Monika von Nussbaum and Barbara Hengesbach at the Henkel Corporate Analytical Center in Dusseldorf, at my direction. Copies of these spectra are attached as Exhibits A-D. Exhibit A is the ^1H NMR of Product F-1. Exhibit B is

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the ^{13}C NMR of Product F-1. Exhibit C is the ^1H NMR of Product F-2. Exhibit D is the ^{13}C of Product F-2.

9. The ^1H and ^{13}C spectra for both Product F-1 and Product F-2 are identical.

10. It is known in the field that in a ^1H NMR spectra, an amide hydrogen should appear at about 9.0 ppm. Neither spectra has any peaks at or about 9.0 ppm. This is indicative that no amides are present.

11. It is known in the field that in a ^{13}C NMR spectra, an imide carbon should appear at about 168 ppm. Both spectra have peaks at 168 ppm. This is indicative of imides being present.

12. Based on the ^1H and ^{13}C NMR spectra of Product F-1 and Product F-2, both products contain imide groups.

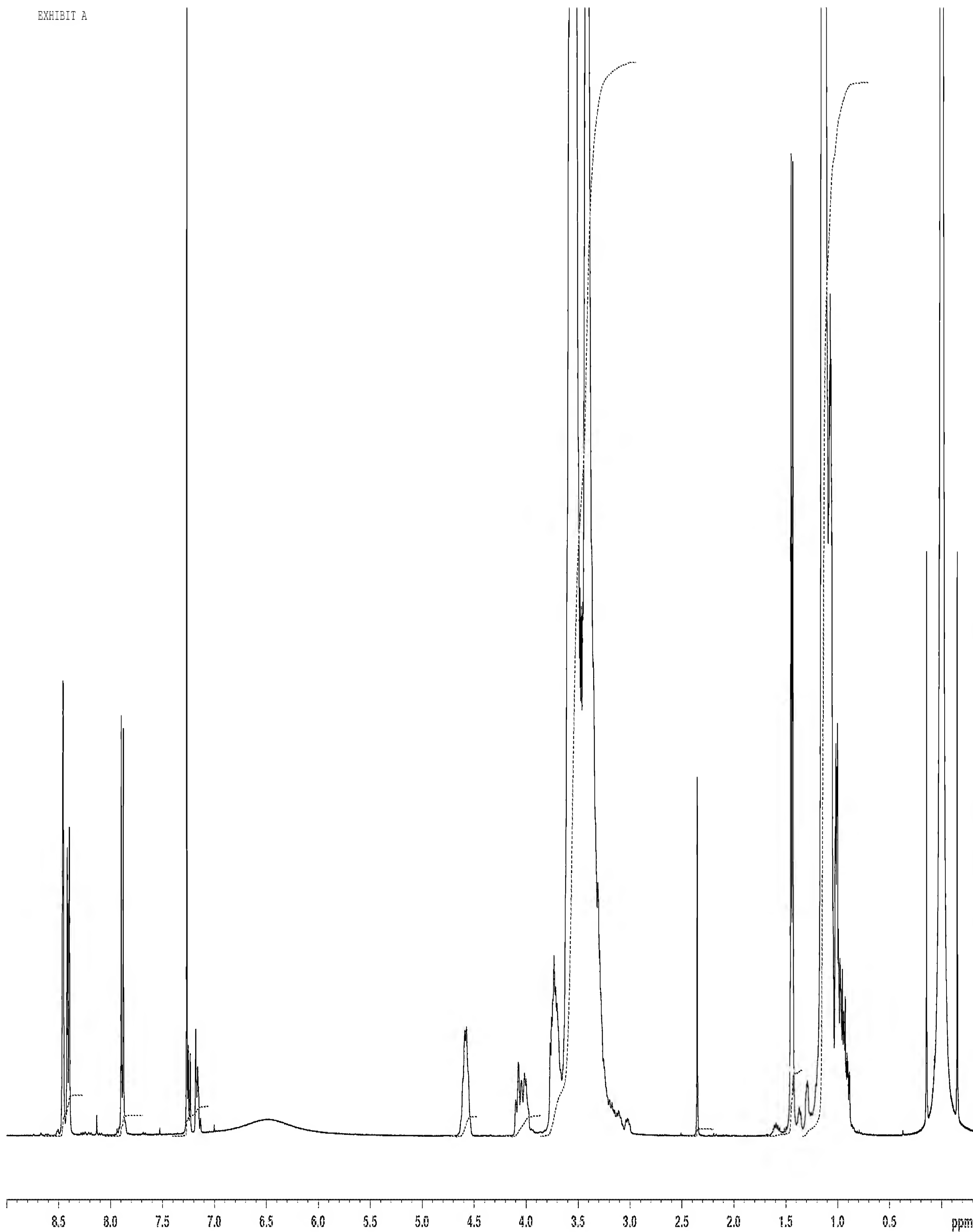
13. The undersigned hereby declares that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Date: 11 - 20 - 2007



Rainer Schoenfeld

EXHIBIT A



Current Data Parameters
NAME fa0707.005
EXPNO 10
PROCNO 1

F2 - Acquisition Parameters
Date_ 20070705
Time 15.12
INSTRUM spect
PROBHD 5 mm Multinucl
PULPROG zg30
TD 32768
SOLVENT CDC13
NS 64
DS 8
SWH 8802.817 Hz
FIDRES 0.268641 Hz
AQ 1.8612725 sec
RG 32
DW 56.800 usec
DE 6.00 usec
TE 298.2 K
D1 10.00000000 sec
MCREST 0.00000000 sec
MCWRK 0.01500000 sec

===== CHANNEL f1 =====
NUC1 1H
P1 7.50 usec
PL1 3.00 dB
SFO1 400.1234010 MHz

F2 - Processing parameters
SI 65536
SF 400.1200066 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00

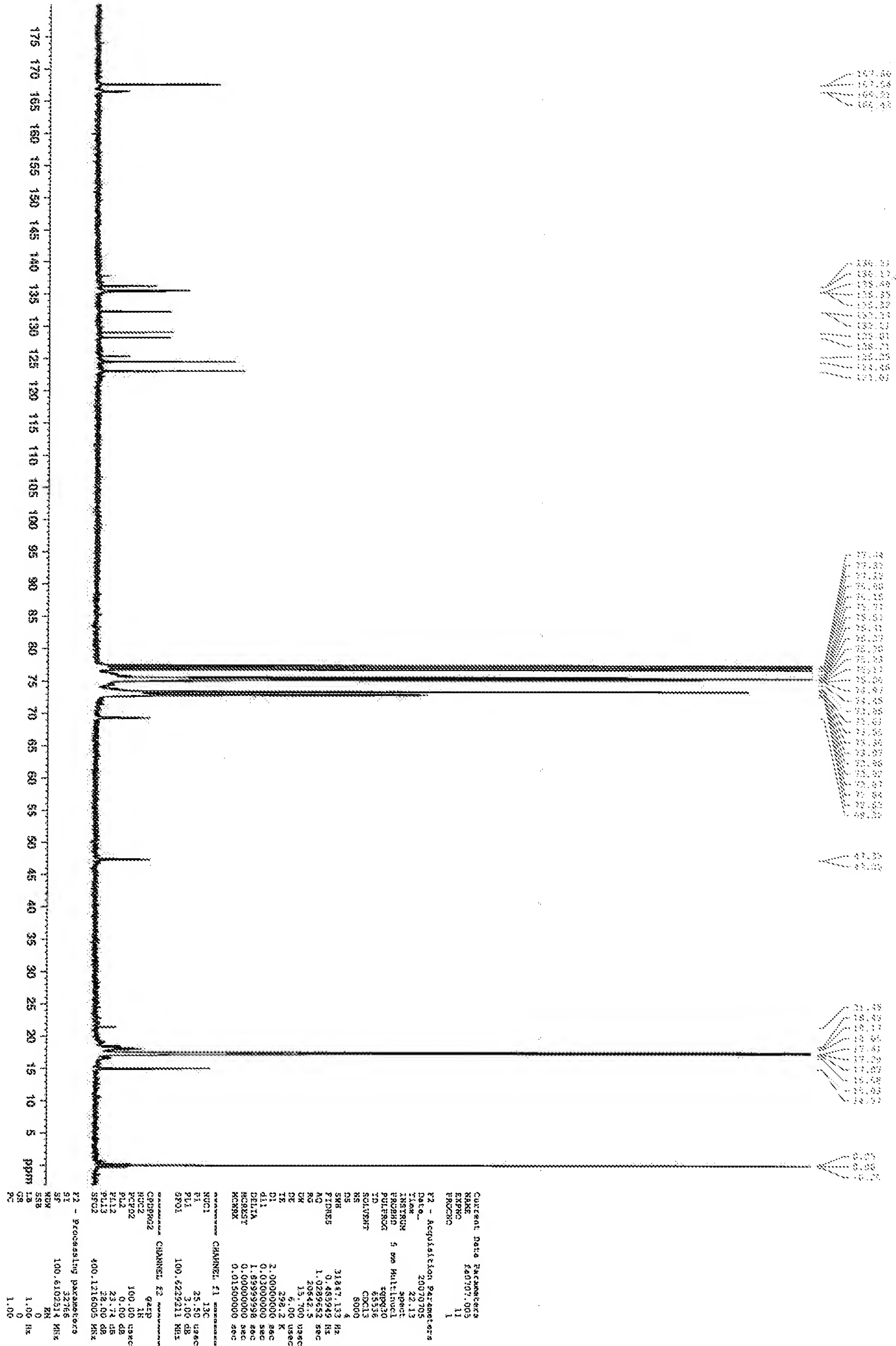
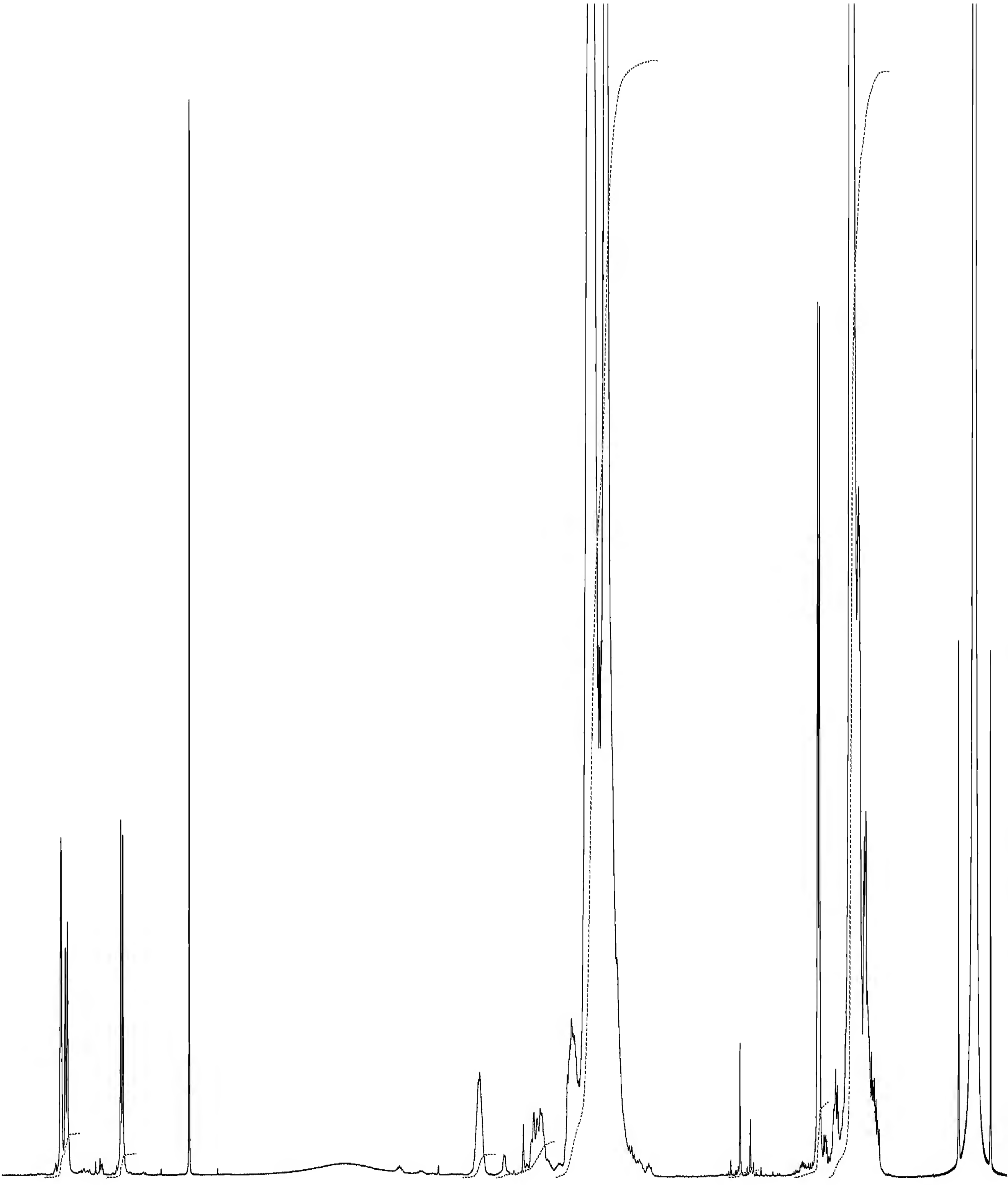


EXHIBIT C



Current Data Parameters
NAME fa0707.006
EXPNO 10
PROCNO 1

F2 - Acquisition Parameters
Date_ 20070705
Time 22.35
INSTRUM spect
PROBHD 5 mm Multinucl
PULPROG zg30
TD 32768
SOLVENT CDCl3
NS 64
DS 8
SWH 8802.817 Hz
FIDRES 0.268641 Hz
AQ 1.8612725 sec
RG 32
DW 56.800 usec
DE 6.00 usec
TE 298.2 K
D1 10.00000000 sec
MCREST 0.00000000 sec
MCWRK 0.01500000 sec

===== CHANNEL f1 =====
NUC1 1H
P1 7.50 usec
PL1 3.00 dB
SFO1 400.1234010 MHz

F2 - Processing parameters
SI 65536
SF 400.1200062 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00

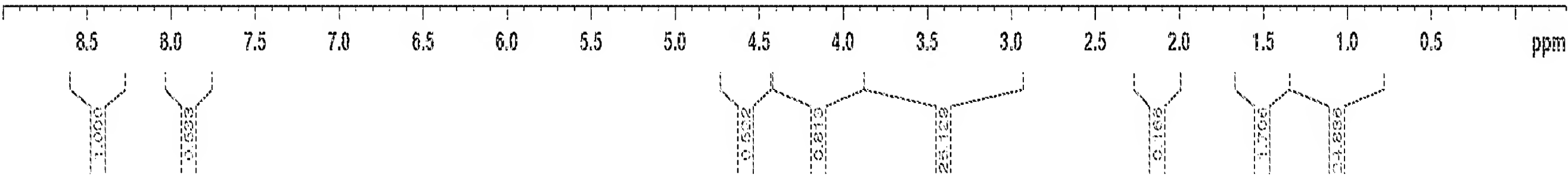
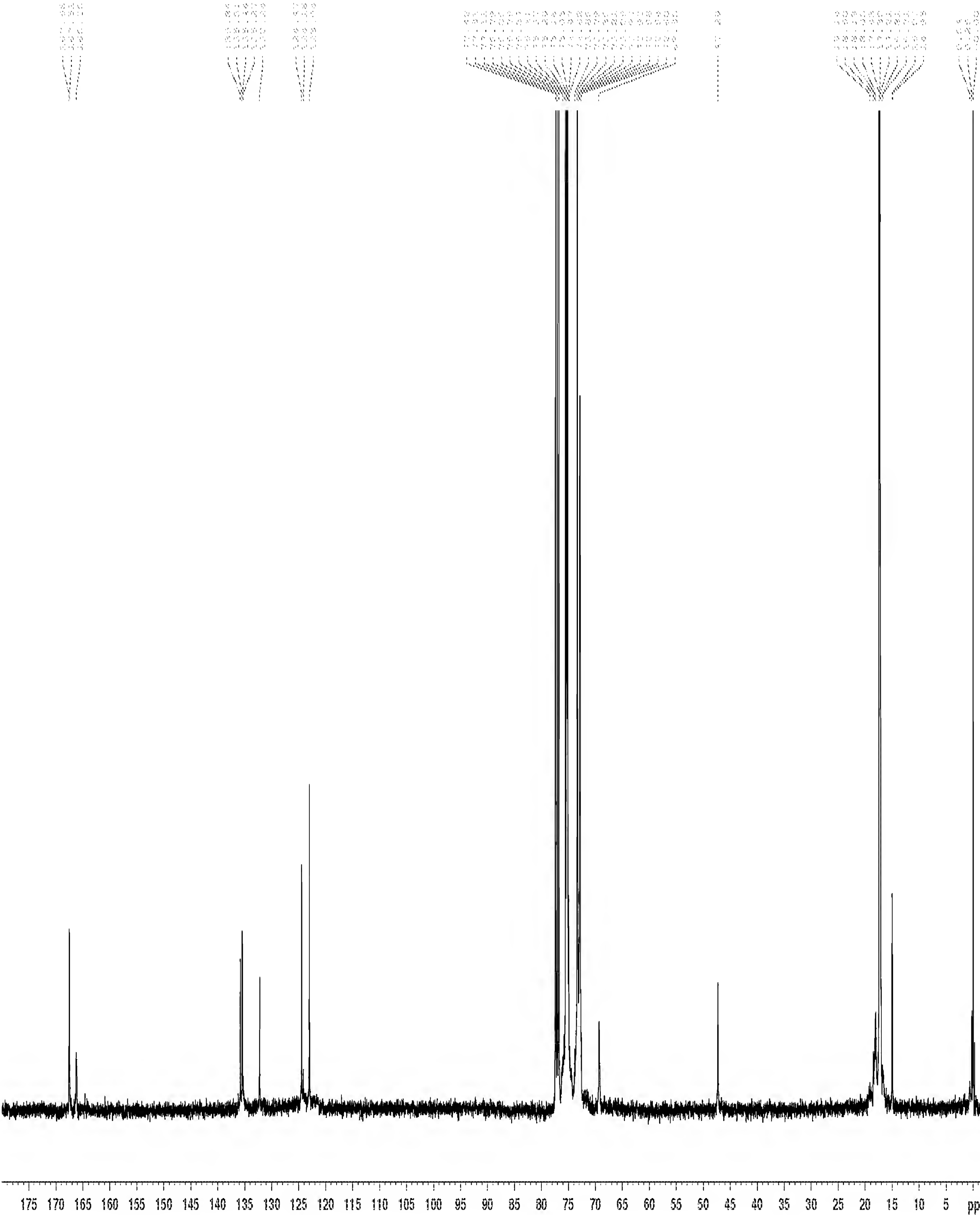


Exhibit D



Current Data Parameters
NAME fa0707.006
EXFNO 11
PROCNO 1

F2 - Acquisition Parameters
Date_ 20070706
Time 5.36
INSTRUM spect
PROBHD 5 mm Multinucl
PULPROG zgpg30
TD 65536
SOLVENT CDCl3
NS 8000
DS 4
SWH 31847.133 Hz
FIDRES 0.485949 Hz
AQ 1.0289652 sec
RG 16384
DW 15.700 usec
DE 6.00 usec
TE 298.2 K
D1 2.00000000 sec
d11 0.03000000 sec
DELTA 1.89999998 sec
MCREST 0.00000000 sec
MCNRK 0.01500000 sec

===== CHANNEL f1 =====
NUC1 13C
P1 25.50 usec
PL1 3.00 dB
SFO1 100.6229211 MHz

===== CHANNEL f2 =====
CPDPRG2 garp
NUC2 1H
PCPD2 100.00 usec
PL2 0.00 dB
PL12 23.74 dB
PL13 28.00 dB
SFO2 400.1216005 MHz

F2 - Processing parameters
SI 32768
SF 100.6102514 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.00